ENVIRONMENTAL IMPACT ASSESSMENT (EIA) STUDY: LEE LING HOUSING DEVELOPMENT PROJECT

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FACULTY OF ENGINEERING
UNIVERSITI MALAYSIA SARAWAK

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FAKULTI KEJURUTERAAN
UNIVERSITI MALAYSIA SARAWAK
2001

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) STUDY:

LEE LING HOUSING DEVELOPMENT PROJECT

By

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A project paper presented to the
Faculty of Engineering
In partial fulfilment of the requirements for the degree in
Bachelor of Engineering (Civil) with Honours

UNIVERSITI MALAYSIA SARAWAK

2001

APPROVAL SHEET

This project paper attached hereto, entitled

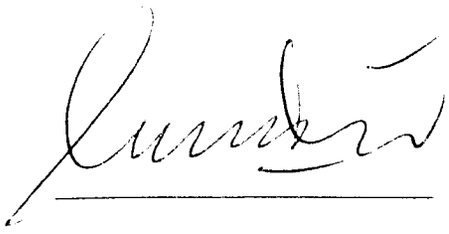
"Environmental Impact Assessment (EIA) Study:

Lee Ling Housing Development Project"

in partial fulfilment of the requirements for the degree in

Bachelor of Engineering (Civil) with Honours

is hereby accepted.



Dr. Law Puong Ling
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12/4/2001

Date

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Dedicated to my beloved family and fiancé

Acknowledgement

I am very grateful for the completion of this project and wish to acknowledge the help of some people without whom this dissertation will never be here.

Firstly, my thanks go to my supervisor, *Dr. Law Puong Ling* for his continual guidance, assistance and suggestions.

Special thanks also go to my best friends, *Doris Primus* and *Siti Zahrah Hj Sahari* for their wonderful support and kindness during this enduring time. Not forgotten to all my course-mates for the happy and great time throughout my study in Unimas.

Thanks to my loving family members, especially dad, *Sapudin Hj Yahya* and mum, *Jaleha Lawai* for their direct and indirect encouragement and understanding.

And last but not least, to my beloved fiancé, *Kamsul Abdul Hamid Dolamin* for his continuous support, encouragement and understanding, mentally and physically during my years in Unimas.

Finally, thanks to God from whom all good things come.

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The proposed project is entitled "Lee ling Housing Development Project".

PROJECT BACKGROUND

Lee Ling Housing Development Project is located at 4½ Mile of Matang Road, Kuching, Sarawak. The project involves the construction and completion of 106 units of terrace houses, 56 units of semi-detached houses, 12 units of detached houses and one unit shopping mall, which covers a total area of 350 acres.

The surrounding area of the proposed project is largely of undeveloped land, agricultural land and human settlements (villages) with the proposed site being a secondary forest.

The main project activities are divided into three (3) categories including pre-construction (site investigation) phase, construction phase and operation phase.

EXISTING PHYSICO-CHEMICAL ENVIRONMENT

Geological Features: The area is classified as riverine swamp alluvium and beach sand of Quaternary Age with Tuang Formation towards its west. The deposits are primarily composed of estuarine and deltaic deposits type.

Land Features: The site is surrounded by secondary forest, human settlements and agricultural area with large undeveloped and abandoned land.

Water Quality: The water of Sungai Sarawak contains moderate sediment load. The water quality of the river is generally exceeds the limits of Class IIB River under the Malaysian Interim Water Quality Standards.

Air Quality: The air quality is well within the limit of the Malaysian Air Quality Standards. The main sources of air pollution are exhaust emission from motor vehicles, dust generation due to exposed soils and smoke generation due to open burning activity at the nearby villages and agricultural areas.

Noise Pollution: The project area is subjected to moderate noise levels of 40-62 dB(A), which is below the annoyance level of 85 dB(A). The main sources of noise pollution are from vehicular traffic and from nearby human activities.

Climate: The area is subjected to uniform temperature, high humidity and plenty of rainfall with generally light winds. The climate is strongly influenced by two monsoons

namely the Northeast monsoon (November–March) and the Southwest monsoon (May–September).

EXISTING BIOLOGICAL ENVIRONMENT

The project area is free of any endangered terrestrial flora and fauna since the land is of secondary forest.

EXISTING HUMAN (SOCIAL) ENVIRONMENT

The present population of Kuching is about 532,100 (116.5 person per square km) with adequate health, recreational, telecommunications and other infrastructures facilities.

ENVIRONMENTAL IMPACTS

Potential Physico-Chemical Environmental Impacts

Land Use and Soil Erosion: Permanent removal of topsoil and surface vegetation is predicted to expose the soil and subsoil to weathering and surface water runoff during heavy rains.

Sedimentation: Exposure of soils to the action of sedimentation may likely to damage all types of vegetation; covering and dirtying public roads and nearby lowland areas; and reducing the depth and capacity of drains and river channels particularly during rainy season.

Water Quality: The proposed project may increase surface water runoff due to exposed land surface; reduce interception storage; and increase soil erosion and sedimentation. Water pollution may be due to unplanned water supply treatment, storm-water drainage, waste-disposal and wastewater treatment.

Air Quality: The main sources of air pollution during the project development are dust generation and exhaust emissions. However, the pollutant concentrations are predicted to be extremely low, which unlikely to cause significant effect to public health.

Noise Pollution: During construction, the noise levels are expected to increase until the project closeout. During operation stage, the noise levels would likely to decrease mainly due to traffic and residences noises.

Solid Wastes: It is expected that significant quantity of solid waste will be generated throughout the development stage. Improper storage and handling may cause attraction to animals, fire hazards and diseases.

Potential Biological Environmental Impacts

Permanent loss of plant and animal species and their habitats may lead to the loss of wilderness and natural landscape of the area. However, long-term impacts are considered to be insignificant since there is no endangered and protected species of flora and fauna are identified.

Potential Human (Social) Environmental Impacts

Health and Safety: Improper installation and usage of sanitary facilities, contaminated water supply and poor handling of wastes are the main sources of health problems. Physical safety during development stage is closely related to risk of accidents in the construction site.

Socio-Economic Issues: The possible impacts of the proposed project are employment opportunity of foreign and local workers; increasing demands for education, services and facilities; and increasing demands for health care and social services.

Utilities and Services: The development of utilities (water supply, electricity) may directly affect the existing consumptions at the vicinity.

Road Traffic and Transportation: Increasing traffic load may be observed during development stage that is predicted to increase traffic hazards in the construction site and public roads.

MITIGATING MEASURES

Mitigating Measures: Physico-Chemical Environment

Land Use and Soil Erosion: Basic soil conservation practice should be implemented by the action of turfing, re-vegetation and landscaping.

Sedimentation: Restricting a buffer strip to control sediments flow into water bodies; constructing retention ponds; and tyre washing for vehicles exiting the site can mitigate the impacts of sedimentation.

Water Quality: Proper management of sanitary facilities and waste disposal may prevent contamination of water supply and river. Water pollution can be avoided by improving site drainage pattern and proper control of waste disposal into water bodies. To improve water quality, landscaping and re-vegetation are highly recommended.

Air Quality: Dust generation can be control by establishing sedimentation trap and wet working surfaces, slowing down traffic and by planting strip buffers. Open burning should be prohibited to avoid air pollution.

Noise Pollution: Limiting operational hours during construction works, introduction of noise barriers or buffers, and the use of quiet, well-maintained equipment can reduce the noise generation during development stage. To avoid occupational hazards caused by noise, all workers at the site should wear hearing protection equipment when operating noisy equipment or during noisy construction works.

Solid Wastes: Implementation of solid waste management by reuse and recovery of waste materials may reduce the amount of solid waste to be disposed. Regular collection and transportation to dumping site should be done to other construction wastes.

Mitigating Measures: Biological Environment

Protection, conservation and restoration programmes can compensate the permanent loss of habitats and species of animal and plant. They involve the establishment of buffer zones at the periphery of the project area and the activity of turfing and re-vegetation during development stage.

Mitigating Measures: Human (Social) Environment

Health and Safety: Hygienic practice and clean supply of water and sanitary facilities will ensure the health of workers from any types of diseases. Improving site security with barriers and fences around the site, proper personal protection equipment and clear road signs and safety procedures can enhance physical safety.

Socio-Economic Issues: Further development of the surrounding area of the site may build a complete chain of community structures. Long term design and planning are essential to predict population density and growth. Collection of municipal wastes and maintenance of public facilities should be established and monitored.

Utilities and Services: It is necessary to upgrade the existing utilities and services at the surrounding area to mitigate increasing demands due to additional load at the site.

Road Traffic and Transportation: Proper road signs may prevent traffic accidents during development stage. During operation, monitoring of traffic density and flow may provide information on future traffic pattern and consumption that may prevent traffic congestion and accidents.

RESIDUAL IMPACTS AND RECOMMENDATIONS

The remaining impacts to be considered after development and operation stages due to uncertainties and lack of suitable data and understanding are of land use and traffic. Permanent loss of natural landscape of the site can only be compensated by the implementation of re-vegetation and continuous landscaping practices. The uncertainties of traffic flow and density that may be generated by the population growth within the area need strategic planning and management by consistent monitoring of traffic circulation and flow.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The EIA study is carried out for a housing development project located at 4½ Mile, Matang Road, Kuching, Sarawak. The project namely Lee Ling Housing Development Project involves the construction and completion of 106 units of terrace houses, 1 unit of shopping mall, 56 units of semi-detached houses and 12 units of detached houses.

Since the proposed project covers an area of more than 50 ha (123 acres), this EIA study is necessary in accordance to the Environmental Quality Act 1974 and the Environmental Quality (Amendment) Act 1985. The Act was promulgated to control and prevent pollution of environment. Under Section 34A of the Act, Environmental Impact Assessment (EIA) prior to approval is a mandatory requirement for activities prescribed in the Environmental Quality (Prescribed Activities) Order 1987.

1.2 PURPOSE OF EIA

1.2.1 Objectives

The purpose of the EIA study for the proposed project are as follow:

(a) To identify and describe the existing environment of the proposed project area in term of its environmental components (physico-chemical, biological and human environment)

(b) To predict potential direct, indirect and cumulative impacts of the proposed project to the proposed site, thus forecast mitigating measures if the project is preceded or alternatives are chosen

(c) To identify residual impacts of the project thus recommend appropriate short and long term monitoring program

1.2.2 Main Issues for Consideration

The main concerns of the EIA study are as follow:

(a) Climatic conditions: Although generally the climate of Malaysia is dry and humid throughout the year, however, the effect of four distinct seasons especially northeast and southwest monsoons will be addressed as to present the nature of the area in term of hydrological aspects.

(b) **Land use:** The land use within the project and its surrounding will be addressed with respect to the current and future potentials.

(c) **Soil condition:** The analysis of soil erosion and sedimentation will be carried out within the tributaries of Sungai Sarawak at the proposed area to present current and future changes due to site development.

(d) **Ecological status:** Site clearing will permanently remove vegetation and animal habitats from the proposed site. Thus, potential impacts and mitigation measures are essentially necessary to be addressed.

(e) **Atmospheric quality:** Incorporates noise and air quality measurements for various locations at the site and its adjacent existing area. Noise pollution due to construction works and air pollution due to dust generation and exhaust emission are also necessary to be addressed.

(f) **Utilities and services:** General survey on existing utilities and services such as water supply, electricity and service demands at the vicinity of the proposed project site should be evaluated as to determine the sufficiency of the area to accommodate additional load.

(g) **Traffic:** The proposed project is most likely to interrupt normal traffic flow and road safety, thus possible rerouting or safety measures should be emphasized.

(h) **Solid waste management:** Solid waste handling, disposal and collection should also be conducted systematically during construction and operational stages of development to ensure that the effect on water quality and health are minimised.